



Full Option Science System
(FOSS™)
Grades Pre-K-8

Correlation
with the

Ohio
Science Content Standards



Full Option Science System (FOSS™) **Grades Pre-K-8**

Correlation
with the

Ohio State Standards

The following correlation of the Ohio Science Standards to the Full Option Science System (FOSS) Program is to show representative examples of investigations and activities that address listed standards and benchmarks. A citation does not reflect all of the investigations or activities that might address a particular standard or grade level expectation.

July 2010

PRE-K

Note: The Pre-K correlation uses the Delta Science First Reader Program (DSFR) and the Delta Pre-K Discovery Kits (Pre-K)

Science Inquiry and Application

During the years of PreK-4 all students must use the following scientific processes to construct their knowledge and understanding in all science content areas:

Scientific Processes	DELTA
Observe and ask questions about the natural environment	How Do We Learn (DSFR) pp. 75-80 Weather (DSFR) pp. 181-187 Body and Senses (Pre-K) p. 26 Touch and Feel Box Insects and Spiders (Pre-K) p. 15 Cricket Visit
Plan and conduct simple investigations	Earth (DSFR) pp. 209-214 Where Is It? Is It Moving? (DSFR) pp. 265-273 Ocean (Pre-K) p. 13 Sink and Float Dinosaurs (Pre-K) p. Creating Fossils
Employ simple equipment and tools to gather data and extend the senses	Plants (DSFR) pp. 129-134 Earth (DSFR) pp. 209-214 Weather (Pre-K) p. 19 Rain Gauge Trees (Pre-K) p. 13 Seeds and Balances
Use appropriate mathematics with data to construct reasonable explanations	Matter (DSFR) p. 330 Science and Math Earth (DSFR) p. 214 Science and Math Weather (Pre-K) p. 20 Snowflake Count Health and Nutrition (Pre-K) p. 12 Measure Me
Communicate about observations, investigations and explanations	Sorting (DSFR) pp. 155-160 About Me (DSFR) pp. 235-244 Trees (Pre-K) p. 18 Tree Sort Insects and Spiders (Pre-K) p. 12 Ant Hunt
Review and ask questions about the observations and explanations of others	Animals (DSFR) pp. 101-107 Sky (DSFR) pp. 295-301 Health and Nutrition (Pre-K) p. 21 Snack Graph Body and Senses (Pre-K) p. 21 Heavy and Light

Earth and Space Science

This topic focuses on observing, exploring and describing the local natural environment.

Content Statements	FOSS
Weather changes every day. Wind, water and temperature are all part of daily weather changes. Weather changes throughout the day and from day to day.	Weather (DSFR) pp. 181-197; Reader pp. 4-17 Weather (Pre-K) p. 12 What is Weather; p. 13 Rain or Snow Walk; p. 14 Blow Wind Blow
The sun and the moon are visible at different times of the day or night. The sun is visible only in the daytime, but the moon is visible sometimes at night and sometimes during the day.	Sky (DSFR) pp. 295-301; Reader pp. 3, 5-13 Where Is It? Is It Moving? (DSFR) pp. 265-273
Water can be observed as lakes, ponds, rivers, streams, the ocean, rainfall, hail, sleet or snow. When it rains, water can create puddles or cause flooding. The puddles and flooding eventually go away. Some areas flood more than others. The ocean is the largest body of water on Earth.	Earth (DSFR) Reader pp. 11-13 Weather (Pre-K) p. 13 Rain or Snow walk Oceans (Pre-K) p. 11 Indoor Beach Party
Rocks and soil have properties that can help	

identify them. Rocks and soil have different colors and textures. Rocks and soil can be sorted by different colors and textures.	Earth (DSFR) pp. 209-214; Reader pp. 5-6
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Physical Science

This topic focuses on making sound and observing, exploring and describing properties of objects and materials that can be found in nature, classrooms and homes.

Content Statements	FOSS
Objects and materials are described by their properties. Color, shape, size, weight and texture are some examples that can be used to describe and/or sort objects and materials.	Plants (DSFR) pp. 129-134 Sorting (DSFR) pp. 129-134; Reader, pp. 3-19 Body and Senses (Pre-K) p. 13 Explore Apple; p. 14 Sound Match Oceans (Pre-K) p. 13 Sink and Float; p. 17 Shell Graph
Many objects can be made to produce sound. Sound can be produced by touching, blowing or tapping objects.	Body and Senses (Pre-K) p. 14 Sound Match; p. 18 Maraca Band

Life Science

This topic focuses on observing, exploring and describing external, physically observable characteristics and behaviors of plants and animals found in their natural environment, in classrooms and homes.

Content Statements	FOSS
There are many distinct environments in Ohio that support different kinds of organisms. Plants and animals have traits that improve their chances of living in different environments. Plants and animals in Ohio interact with one another for food, shelter and nesting.	Plants (DSFR) Reader pp. 6-13 Animals (DSFR) Reader, pp. 4-7, 10-14 Insects and Spiders (Pre-K) p. 12 Ant Hunt; p. 13 Is It an Insect?; p. 15 Cricket Visit Trees (Pre-K) p. 11 Tree Walk; p. 12 It's a Tree's Life
Similarities and differences exist among individuals of the same kinds of plants and animals. Individuals among plants and animals of the same kind show greater likeness than difference, even though they vary in some traits and behaviors. Living things have physical traits and behaviors, which influence their survival. Physical traits and behaviors of plants and animals are sometimes the same and sometimes different from the characteristics ascribed to them in stories.	Plants (DSFR) Reader pp. 2, 5, 9, 11 Animals (DSFR) Reader, pp. 42, 9 Insects and Spiders (Pre-K) p. 12 Ant Hunt; p. 15 Cricket Visit Trees (Pre-K) p. 11 Tree Walk Plants (DSFR) Reader pp. 10-14 Animals (DSFR) Reader, pp. 4-7, 10-11 Insects and Spiders (Pre-K) p. 12 Ant Hunt; p. 13 Is It an Insect?; p. 15 Cricket Visit; p. 16 Pollen Trees (Pre-K) p. 11 Tree Walk The variety of plants and animals in the two programs provides the opportunity for teachers to address this content statement.

Kindergarten

Science Inquiry and Application

During the years of PreK-4 all students must use the following scientific processes to construct their knowledge and understanding in all science content areas:

Note: FOSS is an inquiry-based program and has built into it the science processes listed below. Some examples are listed to illustrate.

Scientific Processes	FOSS
Observe and ask questions about the natural environment	Animals Two by Two Investigation 1, Parts 1-4, pp. 10-29; Investigation 3, Parts 1-3, pp. 8-20 Trees Investigation 1, Parts 1-2, pp. 7-19; Investigation 2, Parts 1-2, pp. 6-15
Plan and conduct simple investigations	Wood and Paper Investigation 1, Parts 3-4, pp. 20-27; Investigation 3, Part 4, pp. 22-25 Animals Two by Two Investigation 1, Part 3, pp. 22-25
Employ simple equipment and tools to gather data and extend the senses	Fabric Investigation 1, Part 4, pp. 20-22 Trees Investigation 1, Part 7, pp. 31-34; Investigation 3, Part 9, pp. 35-38
Use appropriate mathematics with data to construct reasonable explanations	Wood and Paper Investigation 1, Parts 4-5, pp. 24-32 Trees Investigation 1, Part 7, pp. 31-34; Investigation 3, Part 9, pp. 35-38
Communicate about observations, investigations and explanations	Fabric Investigation 2, Parts 1-4, pp. 7-25 Wood and Paper Investigation 1, Parts 1-5, pp. 8-32
Review and ask questions about the observations and explanations of others	Animals Two by Two Investigation 2, Parts 1-4, pp. 9-24 Wood and Paper Investigation 3, Parts 1-4, pp. 8-25

Earth and Space Science

This topic focuses on observing, exploring and describing and comparing weather changes, Patterns in the sky and changing seasons.

Content Statements	FOSS
Weather changes are long term and short term. Weather changes occur throughout the day and from day to day. Air is a nonliving substance that surrounds Earth, wind is moving air. Wind, temperature and precipitation document short-term weather changes. Yearly weather changes (seasons) are observable patterns in the daily weather changes.	Trees Tools for Observing Weather, 1-6, pp. 6-24 Science Stories, pp. 14-23
The moon, sun and stars are visible at different times of the day or night. The moon, sun and stars are in different positions at different times of the day or night. Sometimes the moon is visible during the night, sometimes the moon is visible during the day and at other times the moon is not visible at all. The observable shape of the moon changes in size very slowly throughout each day of every month. The sun is visible only during the day. The sun's position in the sky changes in a single day and from season to season. Stars are visible at night, some are visible	This topic is addressed in the grade 1 module <u>Air and Weather</u> .

in the evening or morning, and some are brighter than others.	
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Physical Science

This topic focuses on the production of sound and observing, exploring and describing properties of objects and materials with which the student is familiar.

Content Statements	FOSS
Objects and materials can be sorted and described by their properties. Objects can be sorted and described by the properties of the materials from which they are made. Some of the properties can include color, size or texture.	Fabric Investigation 1, Parts 1-2, pp. 6-15; Investigation 2, Part 1, pp. 7-11 Wood and Paper Investigation 1, Parts 1-3, pp. 8-19; Investigation 3, Parts 1-4, pp. 8-25
Some objects and materials produce sound. Sound is produced by touching, blowing or tapping objects. The sounds that are produced vary depending on the properties of objects. Sound is produced when objects vibrate.	

Life Science

This topic focuses on observing, exploring and describing and comparing living things in Ohio.

Content Statements	FOSS
Living things are different from nonliving things. Living things include anything that is alive or has ever been alive. Living things have specific traits. Living things grow and reproduce. Living things are found almost everywhere in the world. There are somewhat different kinds in different places.	Animals Two by Two Investigation 1, Parts 1, 4, pp. 10-16, 26-29; Investigation 2, Parts 1, 3, pp. 9-13, 18-21; Investigation 3, Parts 1, 3, pp. 8-12, 17-20; Science Stories, pp. 3-24 Trees investigation 1, Parts 1-8, pp. 7-37; Investigation 3, Parts 1-9, pp. 10-38; Science Stories, pp. 3-23
Living things have physical traits and behaviors, which influence their survival. Living things are made up of a variety of structures. Some of these structures and behaviors influence their survival.	Animals Two by Two Investigation 1, Parts 1, 4, pp. 10-16, 26-29; Investigation 2, Parts 1, 3-4, pp. 9-13, 18-24; Investigation 3, Parts 1, 3, pp. 8-12, 17-20; Investigation 4, Parts 1-2, pp. 8-15; Science Stories, pp. 5-7, 9-11, 13-15, 17-19, 21-22 Trees investigation 1, Parts 5-6, pp. 25-30; Investigation 2, Parts 1-3, pp. 6-19; Investigation 3, Parts 1-2, 4-5, 8, pp. 10-14, 19-25, 33-34 Science Stories, pp. 3, 9, 14-15, 18-24

Grade One

Science Inquiry and Application

During the years of PreK-4 all students must use the following scientific processes to construct their knowledge and understanding in all science content areas:

Note: FOSS is an inquiry-based program and has built into it the science processes listed below. Some examples are listed to illustrate.

Scientific Processes	FOSS
Observe and ask questions about the natural environment	New Plants Investigation 3, Parts 1-3, pp. 8-25 Pebbles, Sand and Silt Investigation 4, Parts 1-3, pp. 8-25 Insects and Plants Investigation 3, Parts 1-3, pp. 129-152
Plan and conduct simple investigations	Solids and Liquids Investigation 4, Parts 1-3, pp. 7-27 Plants and Animals Investigation 1, Parts 1-2, pp. 47-62 Air and Weather Investigation 1, Part 5, pp. 34-38
Employ simple equipment and tools to gather data and extend the senses	Insects Investigation 2, Parts 1-3, pp. 8-24 Air and Weather Investigation 2, Parts 2, 4, pp. 14-19, 24-27 Insects and Plants Investigation 1, Parts 1-3, pp. 52-75
Use appropriate mathematics with data to construct reasonable explanations	Air and Weather Investigation 2, Parts 2, 4, pp. 14-19, 24-27 Pebbles, Sand and Silt Investigation 2, Math Extension, pp. 30-31 New Plants Investigation 1, Part 3, pp. 23-30
Communicate about observations, investigations and explanations	Solids and Liquids Investigation 2, Parts 1-3, pp. 10-27 New Plants Investigation 4, Parts 1-2, pp. 7-19 Balance and Motion Investigation 1, Part 3, pp. 19-23
Review and ask questions about the observations and explanations of others	Insects Investigation 1, Parts 1-3, pp. 8-25 Balance and Motion Investigation 1, Parts 1-3, pp. 8-23 Solids and Liquids Investigation 3, Parts 1-3, pp. 7-27

Earth and Space Science

This topic focuses on the sun as a source of energy and energy changes that occur to land air and water.

Content Statements	FOSS
The sun is the principal source of energy. Sunlight warms Earth's land, air and water. The amount of exposure to sunlight affects the amount of warming or cooling of air, water and land.	Air and Weather Investigation 2, Part 2, pp. 14-19 Science Stories, pp. 20-21
The physical properties of water change. Water can change from a liquid to a solid and from a solid to a liquid. Weather observations can be used to examine the property changes of water.	Solids and Liquids Investigation 4, Part 1, pp. 7-16; Investigation 4, Science Extension, p. 29 Air and Weather Investigation 2, Science Extension, p. 32

Physical Science

This topic focuses on the changes in properties that occur in objects and materials. Changes of position of an object are a result of pushing and pulling.

Content Statements	FOSS
<p>Properties of objects and materials change. Objects and materials change when exposed to various conditions, such as heating or freezing. Not all materials change in the same way.</p>	<p>Solids and Liquids Investigation 4, Part 1, pp. 7-16; Investigation 4, Science Extension, p. 29; Science Stories, pp. 14-17 FOSS Web, Activity: Change It Air and Weather Investigation 2, Science Extension, p. 32</p>
<p>Objects can be moved in a variety of ways, such as straight, zigzag, circular, and back and forth. The position of an object can be described by locating it relative to another object or to the object's surroundings.</p> <p>An object is in motion when its position is changing.</p> <p>The motion of an object can be affected by pushing or pulling. A push or pull is a force that can make an object move faster, slower or go in a different direction.</p>	<p>Balance and Motion Investigation 1, Parts 1-4, pp. 8-28 Air and Weather Investigation 1, Parts 2, 4-5, pp. 13-16, 21-27; Investigation 2, Parts 2, 4, pp. 14-19, 24-27</p> <p>Balance and Motion Investigation 2, Parts 1-3, pp. 8-25; Investigation 3, Parts 1-3, pp. 6-25 Air and Weather Investigation 1, Parts 3, 6, pp. 17-20, 34-38; Investigation 3, Parts 1-5, pp. 8-33</p> <p>Balance and Motion Investigation 2, Parts 1-3, pp. 8-25; Investigation 3, Parts 1-3, pp. 6-25 Air and Weather Investigation 1, Parts 3-6, pp. 17-38; Investigation 3, Parts 3-5, pp. 17-33</p>

Life Science

This topic focuses on the physical needs of living things in Ohio. Energy from the sun or food, nutrients, water, shelter and air are some of the physical needs of living things.

Content Statements	FOSS
<p>Living things have basic needs, which are met by obtaining materials from the physical environment. Living things require energy, water and a particular range of temperatures in their environments.</p> <p>Plants get energy from sunlight. Animals get energy from plants and other animals.</p>	<p>Plants and Animals Investigation 1, Part 1, pp. 47-57; Investigation 3, Parts 1-2, pp. 120-134 Science Resources, pp. 4-6, 22-23 New Plants Investigation 1, Part 2, pp. 13-22; Investigation 2, Part 1, pp. 8-14 Science Stories, pp. 4-6 Insects Investigation 1, Part 1, pp. 8-15; Investigation 4, Part 2, pp. 14-18 Insects and Plants Investigation 2, Part 2, pp. 95-104; Investigation 3, Part 2, pp. 134-144</p> <p>Plants and Animals Investigation 1, Part 1, pp. 47-57; Investigation 3, Parts 1-2, pp. 120-134 Science Resources, p. 6 New Plants Investigation 1, Part 2, pp. 13-22; Investigation 2, Part 1, pp. 8-14 Science Stories, p. 6 Insects Investigation 3, Part 2, pp. 12-20; Investigation 4, Part 2, pp. 14-18 Insects and Plants Investigation 2, Part 2, pp. 95-</p>

<p>Living things acquire resources from the living and nonliving components of the environment.</p>	<p>104; Investigation 4, Part 2, pp. 170-174</p> <p>Plants and Animals Investigation 1, Part 1, pp. 47-57; Investigation 3, Parts 1-3, pp. 120-140 Science Resources, pp. 4-6, 22-24, 28-45</p> <p>New Plants Investigation 1, Part 2, pp. 13-22; Investigation 2, Part 1, pp. 8-14 Science Stories, pp. 4-6, 22-39</p> <p>Insects Investigation 1, Part 1, pp. 8-15; Investigation 4, Parts 2, pp. 14-18;</p> <p>Insects and Plants Investigation 3, Part 2, pp. 134-144; 95-115; Investigation 4, Part 2, pp. 170-175</p>
<p>Living things survive only in environments that meet their needs. Resources are necessary to meet the needs of an individual and populations of individuals. Living things interact with their physical environments as they meet those needs.</p> <p>Effects of seasonal changes within the local environment directly impact the availability of resources.</p>	<p>Plants and Animals Investigation 1, Part 1, pp. 47-57; Investigation 3, Parts 1-3, pp. 120-140 Science Resources, pp. 3-7, 21-24, 28-45 Video: How Plants Live in Different Places</p> <p>New Plants Investigation 1, Parts 2-3, pp. 13-30; Investigation 2, Part 1, pp. 8-14 Science Stories, pp. 3-7, 22-39</p> <p>Insects Investigation 3, Parts 1-3, pp. 8-26; Investigation 4, Parts 2-5, pp. 14-31; Investigation 6, Parts 1-3, pp. 8-22</p> <p>Insects and Plants Investigation 2, Parts 2-3, pp. 95-115; Investigation 3, Parts 1-3, pp. 129-152; Investigation 4, Parts 2-5, pp. 170-193</p> <p>New Plants Science Stories, pp. 25-28, 33</p> <p>Plants and Animals Science Resources, pp. 31-34, 39</p>

Grade Two

Science Inquiry and Application

During the years of PreK-4 all students must use the following scientific processes to construct their knowledge and understanding in all science content areas:

Note: FOSS is an inquiry-based program and has built into it the science processes listed below. Some examples are listed to illustrate.

Scientific Processes	FOSS
Observe and ask questions about the natural environment	New Plants Investigation 3, Parts 1-3, pp. 8-25 Pebbles, Sand and Silt Investigation 4, Parts 1-3, pp. 8-25 Insects and Plants Investigation 3, Parts 1-3, pp. 129-152
Plan and conduct simple investigations	Solids and Liquids Investigation 4, Parts 1-3, pp. 7-27 Plants and Animals Investigation 1, Parts 1-2, pp. 47-62 Air and Weather Investigation 1, Part 5, pp. 34-38
Employ simple equipment and tools to gather data and extend the senses	Insects Investigation 2, Parts 1-3, pp. 8-24 Air and Weather Investigation 2, Parts 2, 4, pp. 14-19, 24-27 Insects and Plants Investigation 1, Parts 1-3, pp. 52-75
Use appropriate mathematics with data to construct reasonable explanations	Air and Weather Investigation 2, Parts 2, 4, pp. 14-19, 24-27 Pebbles, Sand and Silt Investigation 2, Math Extension, pp. 30-31 New Plants Investigation 1, Part 3, pp. 23-30
Communicate about observations, investigations and explanations	Solids and Liquids Investigation 2, Parts 1-3, pp. 10-27 New Plants Investigation 4, parts 1-2, pp. 7-19 Balance and Motion Investigation 1, Part 3, pp. 19-23
Review and ask questions about the observations and explanations of others	Insects Investigation 1, Parts 1-3, pp. 8-25 Balance and Motion Investigation 1, Parts 1-3, pp. 8-23 Solids and Liquids Investigation 3, Parts 1-3, pp. 7-27

Earth and Space Science

This topic focuses on air and water as they relate to weather and weather changes that can be observed and measured.

Content Statements	FOSS
The atmosphere is made up of air. Air has properties that can be observed and measured. The transfer of energy in the atmosphere causes air movement, which is felt as wind. Wind speed and direction can be measured.	Air and Weather Investigation 1, Parts 1-6, pp. 8-38; Investigation 3, Parts 1-5, pp. 8-33 Science Stories, pp. 3-6
Water is present in the air. Water is present in the air as clouds, steam, fog, rain, ice, snow, sleet or hail. When water in the air cools (change of energy), it forms small droplets of water that can be seen as clouds. Water can change from liquid to vapor in the air and from vapor to liquid. The water droplets can form into	Air and Weather Investigation 2, Parts 3-4, pp. 20-27 Science Stories, pp. 8-9, 11-13, 16

raindrops. Water droplets can change to solid by freezing into snow, sleet or hail. Clouds are moved by flowing air.	
Long- and short-term weather changes occur due to changes in energy. Changes in energy affect all aspects of weather, including temperature, precipitation amount and wind.	Air and Weather Investigation 2, Parts 2, 4, pp. 14-19; 24-27; Investigation 3, Parts 1-5, pp. 8-33 Science Stories, pp. 8-9, 11-13, 16-21

Physical Science

This topic focuses on observing the relationship between forces and motion.

Content Statements	FOSS
Forces change the motion of an object. Motion can increase, change direction or stop depending on the force applied.	Air and Weather Investigation 1, Parts 3-6, pp. 17-38; Investigation 3, Parts 1, 3, pp. 8-11, 17-21 Balance and Motion Investigation 2, Parts 1-3, pp. 8-25; Investigation 3, Parts 1-3, pp. 6-25 Science Stories, pp. 10-13, 24-25
The change in motion of an object is related to the size of the force.	Balance and Motion Investigation 2, Parts 1-3, pp. 8-25; Investigation 3, Parts 1-3, pp. 6-25 Air and Weather Investigation 1, Parts 3-4, 6, pp. 17-26, 34-38; Investigation 3, Parts 1, 3, pp. 8-11, 17-21
Some forces act without touching, such as using a magnet to move an object or objects falling to the ground.	Balance and Motion Science Stories, pp. 18-21 Solids and Liquids Investigation 3, Science Extension, p. 31 Air and Weather Investigation 1, Part 3, pp. 17-20; Investigation 3, Parts 1-3, pp. 6-25

Life Science

This topic focuses on how ecosystems work by observations of simple interactions between The biotic/living and abiotic/nonliving parts of an ecosystem. Just as living things impact the Environment in which they live, the environment also impacts living things.

Content Statements	FOSS
Living things cause changes on Earth. Living things function and interact with their physical environments. Living things cause changes in the environments where they live; the changes can be very noticeable or slightly noticeable, fast or slow.	Plants and Animals Investigation 1, Part 1, pp. 47-57; Investigation 3, Parts 1-3, pp. 120-140 Science Resources, pp. 4-7, 16-19, 22-24, 28-45 Video: How Plants Live in Different Places New Plants Investigation 1, Parts 2-3, pp. 13-30; Investigation 2, Part 1, pp. 8-14 Science Stories, pp. 4-7, 22-39 Insects Investigation 3, Parts 2-3, pp. 12-26; Investigation 6, Parts 1-3, pp. 8-22 Science Stories, pp. 4-6, 8-11 Insects and Plants Investigation 2, Parts 2-3, pp. 95-115; Investigation 3, Parts 2-3, pp. 134-152 Science Resources, pp. 4-7
Some kinds of individuals that once lived on Earth have completely disappeared, although they were something like others that are alive today. Living things that once lived on Earth no longer exist; their basic needs were no longer met.	Pebbles, Sand and Silt Science Stories, pp. 26-31

Grade Three

Science Inquiry and Application

During the years of PreK-4 all students must use the following scientific processes to construct their knowledge and understanding in all science content areas:

Note: FOSS is an inquiry-based program and has built into it the science processes listed below. Some examples are listed to illustrate.

Scientific Processes	FOSS
Observe and ask questions about the natural environment	Structures of Life Investigation 1, Parts 1-3, pp. 8-33 Human Body Investigation 3, Parts 1-3, pp. 8-21 Earth Materials Investigation 2, Parts 1-2, pp. 8-21
Plan and conduct simple investigations	Water Investigation 4, Parts 1-3, pp. 8-22 Magnetism and Electricity Investigation 3, Parts 10-26 Human Body Investigation 4, Parts 1-2, pp. 8-19
Employ simple equipment and tools to gather data and extend the senses	Measurement Investigation 4, Parts 1-3, pp. 8-21 Matter and Energy Investigation 3, Parts 2-3, pp. 139-160 Sun, Moon and Stars Investigation 1, Parts 1-2, pp. 42-64
Use appropriate mathematics with data to construct reasonable explanations	Measurement Investigation 2, Part 3, pp. 18-24; Investigation 3, Part 3, pp. 18-21 Matter and Energy Investigation 3, Parts 2-3, pp. 139-160
Communicate about observations, investigations and explanations	Ideas and Inventions Investigation 3, Parts 1-3, pp. 8-21 Earth Materials Investigation 3, Parts 1-2, pp. 8-19 Structures of Life Investigation 2, Part 3, pp. 18-22
Review and ask questions about the observations and explanations of others	Water Investigation 4, Parts 1-2, pp. 8-18 Sun, Moon and Stars Investigation 2, Part 2, pp. 89-100 Magnetism and Electricity Investigation 1, Parts 3-4, pp. 25-34

Earth and Space Science

This topic focuses on Earth's resources. While resources can be living and nonliving, within this strand, the emphasis is on Earth's nonliving resources, such as water, air, rock, soil and the energy resources they represent.

Content Statements	FOSS
Earth's nonliving resources have specific properties. Soil is composed of pieces of rock, organic material, water and air and has characteristics that can be measured and observed. Rocks have unique characteristics that allow them to be sorted and classified. Rocks form in different ways. Air and water are nonliving resources.	Earth Materials Investigation 1, Parts 1-3, pp. 8-29; Investigation 4, Part 1, pp. 8-13 Science Stories, pp. 34-37 Water Science Stories, pp. 17-21 Soil is addressed in the grade 2 module Pebbles, Sand and Silt.
Earth's resources can be used for energy. Many of Earth's resources can be used for the energy they contain. Renewable energy is an energy resource, such as wind, water or solar	Matter and Energy Investigation 1, Part 1, pp. 50-63 Science Stories, pp. 1-5, 9-11, 18-19

energy that is replenished within a short amount of time by natural processes. Nonrenewable energy is an energy resource, such as coal or oil that is a finite energy source that cannot be replenished in a short amount of time.	Water FOSS Web, Activity: Match the Resource
Some of Earth's resources are limited. Some of Earth's resources become limited due to overuse and/or contamination. Reducing resource use, decreasing waste and/or pollution, recycling and reusing can help conserve these resources.	Water Science Stories, pp. 17-21 Measurement Science Stories, pp. 16-17

Physical Science

This topic focuses on the relationship between matter and energy. Matter has specific properties and is found in all substances on earth. Heat is a familiar form of energy that can change the states of matter.

Content Statements	FOSS
All objects and substances in the natural world are composed of matter. Matter takes up space and has weight.	Matter and Energy Investigation 3, Part 1, pp. 129-138 Science Resources, pp. 39, 49, 74
Matter exists in different states, each of which has different properties. The most common states of matter are solids, liquids and gases. Shape and compressibility are properties that can distinguish between the states of matter. The shape of a solid is independent of its container. Liquids and gases flow and take the shape of the container. One way to change matter from one state to another is by heating or cooling.	Matter and Energy Investigation 3, Part 1, pp. 129-138 Science Resources, pp. 39-42, 49-50 Matter and Energy Investigation 3, Part 1, pp. 129-138 Science Resources, pp. 39-42, 49-50 Matter and Energy Investigation 3, Part 1, pp. 129-138 Science Resources, pp. 39-42, 49-50 Matter and Energy Investigation 4, Part 2, pp. 181-192 Science Resources, pp. 51-59, 63-64 Water Investigation 3, Parts 1-4, pp. 8-26 Reader, pp. 13-16 Measurement Science Stories pp. 32-33
Heat, electricity, light and sound are forms of energy. There are many different forms of energy. Energy is the ability to cause motion or create change.	Physics of Sound Investigation 1, Part 3; Investigation 2, Parts 1-3 Science Stories, pp. 6, 22, 28 Magnetism and Electricity Investigation 2, Parts 1-4, pp. 8-29; Investigation 3, Parts 1-3, pp. 10-26; Investigation 4, Parts 1-3, pp. 8-22 Science Stories, pp. 10-13, 21-23 Matter and Energy Investigation 1, Parts 1-3, pp. 50-82; Investigation 2, Parts 1-2, pp. 93-114 Science Resources, pp. 1-36 Ideas and Inventions Investigation 4, Parts 1-3, pp. 8-21

	Science Stories, pp. 23-31
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Life Science

This topic explores life cycles of organisms and the relationship between the natural environment and an organism's (physical and behavioral) traits, which affect its ability to survive and reproduce.

Content Statements	FOSS
<p>Offspring resemble their parents and each other. Individual organisms inherit many traits from their parents indicating a reliable way to transfer information from one generation to the next.</p> <p>Some behavioral traits are learned through interactions with the environment and are not inherited.</p>	<p>FOSS provides the opportunity for teachers to address this content statement. See below: Structures of Life Science Stories, pp. 6-9, 20-21, 41-42 FOSS Web, Activity Life Cycles</p> <p>FOSS provides the opportunity for teachers to address this content statement. See below: Structures of Life Investigation 3, Parts 1, 3-4, pp. 8-15, 20-30; Investigation 4, Part 1, pp. 8-13 Science Stories, pp. 23-24, 26-29, 31-32</p>
<p>Individuals of the same kind differ in their traits and sometimes the differences give individuals an advantage in surviving and reproducing. Plants and animals have physical features that are associated with the environments where they live.</p> <p>Plants and animals have certain physical or behavioral characteristics that improve their chances of surviving in particular environments.</p> <p>Individuals of the same kind have different characteristics that they have inherited. Sometimes these different characteristics give individuals an advantage in surviving and reproducing.</p>	<p>Structures of Life Investigation 2, Part 3, pp. 18-22; Investigation 3, Part 1, pp. 8-15; Investigation 4, Part 1, pp. 8-13 Science Stories, pp. 1-3, 17-21, 22-34, 39-40, 41-42</p> <p>Structures of Life Investigation 2, Part 3, pp. 18-22; Investigation 3, Part 1, pp. 8-15; Investigation 4, Part 1, pp. 8-13 Science Stories, pp. 1-3, 17-21, 22-34, 39-40, 41-42</p> <p>FOSS provides the opportunity for teachers to address this content statement. See below: Structures of Life Investigation 3, Part 1, pp. 8-15; Investigation 4, Part 1, pp. 8-13</p>
<p>Plants and animals have life cycles that are part of their adaptations for survival in their natural environments. Over the whole earth, organisms are growing, reproducing, dying and decaying. The details of the life cycle are different for different organisms affecting their ability to survive and reproduce in their natural environments.</p>	<p>FOSS provides the opportunity for teachers to address this content statement. See below: Structures of Life Science Stories, pp. 20-21 FOSS Web, Activity: Life Cycles</p>

Grade Four

Science Inquiry and Application

During the years of PreK-4 all students must use the following scientific processes to construct their knowledge and understanding in all science content areas:

Note: FOSS is an inquiry-based program and has built into it the science processes listed below. Some examples are listed to illustrate.

Scientific Processes	FOSS
Observe and ask questions about the natural environment	Structures of Life Investigation 1, Parts 1-3, pp. 8-33 Human Body Investigation 3, Parts 1-3, pp. 8-21 Earth Materials Investigation 2, Parts 1-2, pp. 8-21
Plan and conduct simple investigations	Water Investigation 4, Parts 1-3, pp. 8-22 Magnetism and Electricity Investigation 3, Parts 10-26 Human Body Investigation 4, Parts 1-2, pp. 8-19
Employ simple equipment and tools to gather data and extend the senses	Measurement Investigation 4, Parts 1-3, pp. 8-21 Matter and Energy Investigation 3, Parts 2-3, pp. 139-160 Sun, Moon and Stars Investigation 1, Parts 1-2, pp. 42-64
Use appropriate mathematics with data to construct reasonable explanations	Measurement Investigation 2, Part 3, pp. 18-24; Investigation 3, Part 3, pp. 18-21 Matter and Energy Investigation 3, Parts 2-3, pp. 139-160
Communicate about observations, investigations and explanations	Ideas and Inventions Investigation 3, Parts 1-3, pp. 8-21 Earth Materials Investigation 3, Parts 1-2, pp. 8-19 Structures of Life Investigation 2, Part 3, pp. 18-22
Review and ask questions about the observations and explanations of others	Water Investigation 4, Parts 1-2, pp. 8-18 Sun, Moon and Stars Investigation 2, Part 2, pp. 89-100 Magnetism and Electricity Investigation 1, Parts 3-4, pp. 25-34

Earth and Space Science

This topic focuses on the variety of processes that shape and reshape Earth's surface.

Content Statements	FOSS
Earth's surface has specific characteristics and landforms that can be identified. About 70 percent of the Earth's surface is covered with water and most of that is the ocean. Only a small portion of the Earth's water is freshwater, which is found in rivers, lakes and groundwater. Earth's surface can change due to erosion and deposition of soil, rock or sediment. Catastrophic events such as flooding, volcanoes and earthquakes can create landforms.	Water Science Stories, pp. 1-2, 4-9, 17 Earth Materials Science Stories, pp. 5-7 This topic is further addressed in the grade 5 module Landforms.
The surface of Earth changes due to weathering. Rocks change shape, size and/or form due to water	Earth Materials Science Stories, pp. 1-2, 5-7

or ice movement, freeze and thaw, wind, plant growth, gases in the air, pollution and catastrophic events such as earthquakes, mass wasting, flooding and volcanic activity.	
The surface of Earth changes due to erosion and deposition. Water, wind and ice physically remove and carry (erosion) rock, soil and sediment and deposit the material in a new location. Gravitational force affects movements of water, rock and soil.	Earth Materials Science Stories, pp. 2, 6 Earth Materials Science Stories, pp. 5-6

Physical Science

This topic focuses on the conservation of matter and physical properties of matter that allow the transfer of heat or electricity.

Content Statements	FOSS
The total amount of matter is conserved when it undergoes a change. When an object is broken into smaller pieces, when a solid is dissolved in a liquid or when matter changes state (solid, liquid, gas), the total amount of matter remains constant	FOSS provides the opportunity for teachers to address this content statement. See below: Matter and Energy investigation 4, Part 3, pp. 193-203 Science Resources, p. 70
Heat results when substances burn, when certain kinds of materials rub against each other, and when electricity flows through wires. Metals are good conductors of heat and electricity. Electricity flowing through an electric circuit produces magnetic effects in the wire. Electrical energy in circuits can be changed to other forms of energy, including light, heat, sound and motion. Electric circuits require a complete loop through conducting materials in which an electric current can pass.	Magnetism and Electricity Investigation 2, Parts 1-4, pp. 8-29; Investigation 3, Parts 1-3, pp. 10-26; Investigation 4, Parts 1-3, pp. 8-22 Science Stories, pp. 21-23, 32-33 Matter and Energy Investigation 1, Part 1, pp. 50-62 Science Resources, p. 14

Life Science

This topic focuses on using fossil evidence and living organisms to observe that suitable habitats depend upon a combination of biotic and abiotic factors.

Content Statements	FOSS
Changes in an organism's environment are sometimes beneficial to its survival and sometimes harmful. Ecosystems can change gradually or dramatically. When the environment changes, some plants and animals survive and reproduce and others die or move to new locations. An animal's patterns of behavior are related to the environment. This includes the kinds and numbers of other organisms present, the availability of food and resources, and the physical attributes of the environment.	Structures of Life Science Stories, pp. 24, 27-32, 34-36
Fossils can be compared to one another and to present day organisms according to their similarities and differences. The concept of biodiversity is expanded to include	Human Body Science Stories, p. 11

<p>different classification schemes based upon shared internal and external characteristics of organisms.</p> <p>Most species that have lived on Earth no longer exist.</p> <p>Fossils provide a point of comparison between the types of organisms that lived long ago and those existing today.</p>	<p>Structures of Life Science Stories, pp. 45-48</p> <p>Structures of Life Science Stories, pp. 45-48 Human Body Science Stories, pp. 45-48</p>
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Grade Five

Science Inquiry and Application

During the years of grades 5-8 all students must use the following scientific processes to construct their knowledge and understanding in all science content areas:

Note: FOSS is an inquiry-based program and has built into it the science processes listed below. Some examples are listed to illustrate.

Scientific Processes	FOSS
Identify questions that can be answered through scientific investigations	Food and Nutrition Investigation 1, Parts 1-2, pp. 8-20 Models and Designs Investigation 4, Parts 1-2, pp. 6-15 Landforms Investigation 3, Parts 1-3, pp. 8-24
Design and conduct a scientific investigation	Variables Investigation 3, Part 3, pp. 20-23 Environments Investigation 2, Parts 2-4, pp. 16-30 Solar Energy Investigation 4, Part 3, pp. 24-28
Use appropriate mathematics, tools and techniques to gather data and information	Levers and Pulleys Investigation 1, Parts 2-3, pp. 18-28 Water Planet Investigation 3, Part 1, pp. 125-135 Mixtures and Solutions Investigation 1, Part 2, pp. 16-20
Analyze and interpret data	Variables Investigation 1, Parts 1-3, pp. 8-27 Solar Energy Investigation 3, Parts 1-2, pp. 8-23 Living Systems Investigation 2, Part 1, pp. 85-98
Develop descriptions, models, explanations and predictions	Models and Designs Investigation 2, Parts 1-2, pp. 8-21 Environments Investigation 4, Parts 1-3, pp. 8-22 Water Planet Investigation 3, Parts 1-3, pp. 125-158
Think critically and logically to connect evidence and explanations	Mixtures and Solutions Investigation 4, Parts 1-3, pp. 8-24 Variables Investigation 2, Parts 1-3, pp. 8-23 Levers and Pulleys Investigation 3, Parts 1-2, pp. 8-20
Recognize and analyze alternative explanations and predictions	Environments Investigation 5, Parts 1-3, pp. 8-22 Landforms Investigation 3, Parts 1-3, pp. 8-24 Models and Designs Investigation 2, Parts 1-2, pp. 8-21
Communicate scientific procedures and explanations	Living Systems Investigation 3, Parts 1-3, pp. 118-141 Environments Investigation 3, Parts 1-3, pp. 8-22 Solar Energy Investigation 2, Parts 1-2, pp. 8-24

Earth and Space Science

This topic focuses on the characteristics, cycles and patterns in the solar system and within the universe.

Content Statements	FOSS
The solar system includes the sun and all celestial bodies that orbit the sun. Each planet in the solar system has unique characteristics. The distance from the sun, size, composition and movement of each planet are unique. Planets revolve around the sun in elliptical orbits. Some of the planets have moons and/or debris that orbit	Water Planet Investigation 1, Part 1, pp. 50-58 Science Resources, pp. 4-13, 29-22

them. Comets, asteroids and meteoroids orbit the sun.	
The sun is one of many stars that exist in the universe. The sun appears to be the largest star in the sky because it is the closest star to Earth. Some stars are larger than the sun and some stars are smaller than the sun.	Water Planet Investigation 1, Part 1, pp. 50-58 Science Resources, pp. 1-3, 20
Most of the cycles and patterns of motion between the Earth and sun are predictable. Earth's revolution around the sun takes approximately 365 days. Earth completes one rotation on its axis in a 24-hour period, producing day and night. This rotation makes the sun, stars and moon appear to change position in the sky. Earth's axis is tilted at an angle of 23.5°. This tilt, along with Earth's revolution around the sun, affects the amount of direct sunlight that the Earth receives in a single day and throughout the year. The average daily temperature is related to the amount of direct sunlight received. Changes in average temperature throughout the year are identified as seasons.	This topic is further addressed in the grade 6 modules Planetary Science and Weather and Water.

Physical Science

This topic focuses on the forces that affect motion. This includes the relationship between the speed of an object, the amount of force applied and the weight of the object. Light and sound are explored as forms of energy that move in predictable ways, depending on the matter through which they move.

Content Statements	FOSS
The amount of change in movement of an object is based on the weight of the object and the amount of force exerted. Movement can be measured by speed. The speed of an object is calculated by determining the distance (d) traveled in a period of time (t). Earth pulls down on all objects with gravitational force. Weight is a measure of the gravitational force between an object and the Earth. The weight of the object and the amount of force applied affect the speed of the object.	FOSS provides the opportunity for teachers to address this content statement. See below: Models and Designs Investigation 3, Parts 1-3, pp. 8-23 This topic is further addressed in the grade 6 module Force and Motion. Models and Designs Science Stories, pp. 40-41 This topic is further addressed in the grade 6 module Forces and Motion.
Light and sound are forms of energy that behave in predictable ways. Light travels and maintains its direction until it interacts with an object or when it moves from one medium to another, and then it can be reflected, refracted or absorbed. Sound is produced by vibrating objects and requires a medium through which to travel. The rate of vibration is related to the pitch of the sound.	This topic is addressed in the grade 4 module Matter and Energy. This topic is addressed in the grade 4 module Physics of Sound.

Life Science

This topic focuses on foundational knowledge of the structures and functions of ecosystems.

Content Statements	FOSS
<p>Organisms perform a variety of roles in an ecosystem. Populations of organisms can be categorized by how they acquire energy.</p> <p>Food webs can be used to identify the relationships among producers, consumers and decomposers in an ecosystem.</p>	<p>Environments Science Stories, pp. 39-41</p> <p>This topic is further addressed in the grade 6 module Populations and Ecosystems.</p> <p>Environments Science Stories, pp. 40-41, 43-45 Living Systems Investigation 1, Part 1, pp. 51-59</p> <p>This topic is further addressed in the grade 6 module Populations and Ecosystems.</p>
<p>All of the processes that take place within organisms require energy. For ecosystems, the major source of energy is sunlight.</p> <p>Energy entering ecosystems as sunlight is transferred and transformed by producers into energy that organisms use through the process of photosynthesis. That energy then passes from organism to organism as illustrated in food webs.</p> <p>In most ecosystems, energy derived from the sun is transferred and transformed into energy that organisms use by the process of photosynthesis in plants and other photosynthetic organisms.</p>	<p>Environments Science Stories, pp. 38-41 Living Systems Investigation 3, Part 1, pp. 118-141 Science Resources, pp. 31-34</p> <p>Environments Science Stories, pp. 38-41 Living Systems Investigation 3, Part 1, pp. 118-141 Science Resources, pp. 31-34</p> <p>Environments Science Stories, pp. 38-41 Living Systems Investigation 3, Part 1, pp. 118-141 Science Resources, pp. 31-34</p>

Grade Six

Science Inquiry and Application

During the years of grades 5-8 all students must use the following scientific processes to construct their knowledge and understanding in all science content areas:

Note: FOSS is an inquiry-based program and has built into it the science processes listed below. Some examples are listed to illustrate.

Scientific Processes	FOSS
Identify questions that can be answered through scientific investigations	Food and Nutrition Investigation 1, Parts 1-2, pp. 8-20 Models and Designs Investigation 4, Parts 1-2, pp. 6-15 Weather and Water Investigation 4, Part 1, pp. 121-130
Design and conduct a scientific investigation	Variables Investigation 3, Part 3, pp. 20-23 Environments Investigation 2, Parts 2-4, pp. 16-30 Diversity of Life Investigation 9, Part 2, pp. 278-285
Use appropriate mathematics, tools and techniques to gather data and information	Levers and Pulleys Investigation 1, Parts 2-3, pp. 18-28 Water Planet Investigation 3, Part 1, pp. 125-135 Planetary Science Investigation 8, Parts 3-4, pp. 260-270
Analyze and interpret data	Variables Investigation 1, Parts 1-3, pp. 8-27 Solar Energy Investigation 3, Parts 1-2, pp. 8-23 Chemical Interactions Investigation 5, Part 3, pp. 165-171
Develop descriptions, models, explanations and predictions	Models and Designs Investigation 2, Parts 1-2, pp. 8-21 Environments Investigation 4, Parts 1-3, pp. 8-22 Earth History Investigation 4, Part 3, pp. 138-146
Think critically and logically to connect evidence and explanations	Mixtures and Solutions Investigation 4, Parts 1-3, pp. 8-24 Variables Investigation 2, Parts 1-3, pp. 8-23 Force and Motion Investigation 7, Part 2, pp. 262-266
Recognize and analyze alternative explanations and predictions	Environments Investigation 5, Parts 1-3, pp. 8-22 Landforms Investigation 3, Parts 1-3, pp. 8-24 Planetary Science Investigation 5, Parts 2-3, pp. 158-162
Communicate scientific procedures and explanations	Living Systems Investigation 3, Parts 1-3, pp. 118-141 Environments Investigation 3, Parts 1-3, pp. 8-22 Electronics Investigation 6, Part 3, pp. 195-200

Earth and Space Science

This topic focuses on the study of rocks, minerals and soil which make up the lithosphere. By classifying and identifying different types of rocks, minerals and soil, the past environment in which they formed can be decoded.

Content Statements	FOSS
Minerals have specific, quantifiable properties. Minerals are naturally occurring, inorganic solids that have a defined chemical composition. Minerals have properties that can be observed and	Earth History Resources, p. 89

measured. Minerals form in specific environments.	
Igneous, metamorphic and sedimentary rocks have unique characteristics that can be used for identification and/or classification. Most rocks are composed of one or more minerals, but there are a few types of sedimentary rocks that contain organic material, such as coal. The composition of the rock, types of mineral present, mineral arrangement, and/or mineral shape and size can be used to identify the rock and to interpret its history of formation, breakdown (weathering) and transport (erosion).	Earth History Investigation 8, Parts 1-3, pp. 254-270 Resources, pp. 93-97 CD: Geology Lab, Rock Database
Igneous, metamorphic and sedimentary rocks form in different ways. Magma or lava cools and crystallizes to form igneous rocks. Heat and pressure applied to existing rock forms metamorphic rocks. Sedimentary rock forms as existing rock weathers chemically and/or physically and the weathered material is compressed and then lithifies. Each rock type can provide information	Earth History Investigation 8, Parts 1-3, pp. 254-270 Resources, pp. 93-97 CD: Geology Lab, Rock Database
Soil is unconsolidated material that contains nutrient matter and weathered rock. Soil formation occurs at different rates and is based on environmental conditions, type of existing bedrock and rates of weathering. Soil forms in layers known as horizons. Soil horizons can be distinguished from one another based on properties that can be measured.	
Rocks, minerals and soils have common and practical uses. Nearly all manufactured material requires some kind of geologic resource. Most geologic resources are considered nonrenewable. Rocks, minerals and soil are examples of geologic resources that are nonrenewable.	Solar Energy FOSS Web: Resource ID

Physical Science

This topic focuses on the study of foundational concepts of the particulate nature of matter, linear motion, and kinetic energy.

Content Statements	FOSS
All matter is made up of small particles called atoms. Each atom takes up space, has mass and is in constant motion. Mass is the amount of matter in an object.	Mixtures and Solutions Science Stories, pp. 25-26 Chemical Interactions Investigation 9, Part 1, pp. 280-287 Resources, pp. 14-15, 23-27, 104
Elements are a class of substances composed of a single kind of atom.	Mixtures and Solutions Science Stories, p. 25 Chemical Interactions Investigation 2, Parts 1-2, pp. 70-80 Resources, pp. 4-6, 10-15, 96
Molecules are the combination of two or more atoms that are joined together chemically.	Mixtures and Solutions Science Stories, pp. 26-28 Chemical Interactions Investigation 9, Parts 1-2,

<p>Compounds are composed of two or more different elements. Each element and compound has properties, which are independent of the amount of the sample.</p>	<p>pp. 280-297 Resources, pp. 64-77, 96</p> <p>Mixtures and Solutions Science Stories, pp. 25-26 Chemical Interactions Investigation 9, Parts 1-4, pp. 280-312; Investigation 10, Parts 1-2, pp. 323-330 Resources, pp. 64-77, 96</p>
<p>Changes of state are explained by a model of matter composed of atoms and/or molecules that are in motion. Atoms and molecules are not changed in structure when a substance undergoes a change of state; the amount of motion of the atoms and molecules is changed. Thermal energy is a measure of the motion of the atoms and molecules in a substance.</p> <p>Mass is conserved when substances undergo changes of state.</p>	<p>Water Planet Science Resources, pp. 28-30, 33-34, 38-39 Chemical Interactions Investigation 7, Parts 4-5, pp. 222-2334 Resources, pp. 26-27, 43-48 Multimedia: Particles in Solid, Liquid and Gas</p> <p>FOSS provides the opportunity for teachers to address this content statement. See below: Chemical Interactions Investigation 7, Parts 4-5, pp. 22-234 Resources, pp. 26-27, 44-46</p>
<p>There are two categories of energy: kinetic and potential. Objects and substances in motion have kinetic energy.</p> <p>Objects and substances can store energy as a result of its position (potential energy).</p>	<p>FOSS provides the opportunity for teachers to address this content statement. See below: Variables Investigation 1, Part 1, pp. 8-16; Investigation 3, Parts 1-3, pp. 8-23; Investigation 4, Parts 1-3, pp. 8-28 Models and Designs Investigation 3, Parts 1-3, p. 8-23; Investigation 4, Parts 1-2, pp. 6-15 Force and Motion Investigation 1, Part 1, pp. 47-56; Investigation 2, Part 3, pp. 89-99; investigation 5, Parts 1-4, pp. 169-201</p> <p>FOSS provides the opportunity for teachers to address this content statement. See below: Variables Investigation 1, Part 1, pp. 8-16; Investigation 3, Parts 1-3, pp. 8-23; Investigation 4, Parts 1-3, pp. 8-28 Models and Designs Investigation 3, Parts 1-3, p. 8-23; Investigation 4, Parts 1-2, pp. 6-15 Force and Motion Investigation 1, Part 1, pp. 47-56; Investigation 2, Part 3, pp. 89-99; investigation 5, Part 2, pp. 177-186</p>
<p>An object's motion can be described by its speed and the direction in which it is moving. An object's position and speed can be measured and graphed as a function of time.</p>	<p>Force and Motion Investigation 2, Parts 2-3, pp. 83-99; Investigation 3, Parts 1-2, pp. 111-123</p>

Life Science

This topic focuses on the study of the basics of Modern Cell Theory. All organisms are composed of cells, which are the fundamental unit of life. Cells carry on the many processes that sustain life. All cells come from pre-existing cells.

Content Statements	FOSS
<p>Cells are the fundamental unit of life. All living things are composed of cells. Different body tissues and organs are made of different kinds of cells. The ways cells function are similar in all living organisms</p>	<p>Food and Nutrition Science Stories, pp. 41-42 Living Systems Investigation 1, Parts 1-2, pp. 51-65; Investigation 2, Part 1, pp. 85-106 Science Resources, pp. 1-3, 11-13 Diversity of Life Investigation 3, Parts 1-3, pp. 102-122; Investigation 4, Parts 1-2, pp. 133-141 Resources, pp. 27-30</p>
<p>All cells come from pre-existing cells. Cells repeatedly divide resulting in more cells and growth and repair in multicellular organisms.</p>	<p>Diversity of Life Resources, pp. 26-27, 43 Populations and Ecosystems Resources, p. 53</p>
<p>Cells carry on specific functions that sustain life. Many basic functions of organisms occur in cells. Cells take in nutrients and energy to perform work, like making various molecules required by that cell or an organism.</p> <p>Every cell is covered by a membrane that controls what can enter and leave the cell.</p> <p>Within the cell are specialized parts for the transport of materials, energy capture and release, protein building, waste disposal, information feedback and movement.</p>	<p>Food and Nutrition Science Stories, p. 43 Diversity of Life Investigation 3, Parts 1-3, pp. 102-122; Investigation 4, Part 3, pp. 137-141 Resources, pp. 25-26, 28-30 CD: Cells and the Ribbon of Life</p> <p>Diversity of Life Investigation 3, Parts 2-3, pp. 108-122; Investigation 4, Parts 1-2, pp. 133-141 Resources, pp. 24-30</p> <p>Diversity of Life Investigation 4, Part 3, pp. 137-141 Resources, pp. 25-30 CD: Cells and the Ribbon of Life</p>
<p>Living systems at all levels of organization demonstrate the complementary nature of structure and function. Level of organization within organisms includes cells, tissues, organs, organ systems and whole organisms.</p> <p>Whether the organism is single-celled or multicellular, all of its parts function as a whole to perform the tasks necessary for the survival of the organism.</p> <p>Organisms have diverse body plans, symmetry and internal structures that contribute to their being able to survive in their environments.</p>	<p>Living Systems Investigation 1, Parts 1-2, pp. 51-65; Investigation 2, Part 1, pp. 85-98 Science Resources, pp. 1-13, 16-20 Diversity of Life Investigation 4, Part 1, pp. 133-136; Investigation 5, Parts 1-3, pp. 151-170; Investigation 7, Part 1, pp. 218-223; Investigation 8, Part 1, pp. 239-243 Resources, pp. 27-44</p> <p>Living Systems Science Resources, pp. 1-13 Diversity of Life Investigation 3, Parts 1-3, pp. 102-122; Investigation 4, Parts 1-2, pp. 133-141; Investigation 5, Parts 1-3, pp. 151-170; Investigation 7, Part 1, pp. 218-223; Resources, pp. 24-44</p> <p>Living Systems Investigation 1, Parts 1-3, pp. 51-70; Investigation 2, Part 1, pp. 85-98 Science Resources, pp. 1-13, 16-20 Diversity of Life Investigation 8, Part 1, pp. 239-243; Investigation 9, Parts 1-2, pp. 273-285 Resources, pp. 51-54</p>

Grade Seven

Science Inquiry and Application

During the years of grades 5-8 all students must use the following scientific processes to construct their knowledge and understanding in all science content areas:

Note: FOSS is an inquiry-based program and has built into it the science processes listed below. Some examples are listed to illustrate.

Scientific Processes	FOSS
Identify questions that can be answered through scientific investigations	Populations and Ecosystems Investigation 5, Part 1, pp. 142-150 Planetary Science Investigation 5, Parts 2-3, pp. 158-167 Weather and Water Investigation 4, Part 1, pp. 121-130
Design and conduct a scientific investigation	Chemical Interactions Investigation 8, Part 1, pp. 248-255 Force and Motion Investigation 2, Part 3, pp. 89-99 Diversity of Life Investigation 9, Part 2, pp. 278-285
Use appropriate mathematics, tools and techniques to gather data and information	Force and Motion Investigation 1, Part 2, pp. 57-62 Electronics Investigation 2, Part 3, pp. 99-103 Planetary Science Investigation 8, Parts 3-4, pp. 260-270
Analyze and interpret data	Weather and Water Investigation 5, Part 1, pp. 152-162 Populations and Ecosystems Investigation 10, Part 1, pp. 302-310 Chemical Interactions Investigation 5, Part 3, pp. 165-171
Develop descriptions, models, explanations and predictions	Planetary Science Investigation 9, Parts 2-4, pp. 288-301 Human Brain and Senses Investigation 3, Parts 1-3, pp. 92-110 Earth History Investigation 4, Part 3, pp. 138-146
Think critically and logically to connect evidence and explanations	Diversity of Life Investigation 6, Parts 1-2, pp. 186-197 Chemical Interactions Investigation 9, Part 2, pp. 288-297 Force and Motion Investigation 7, Part 2, pp. 262-266
Recognize and analyze alternative explanations and predications	Earth History Investigation 6, Part 4, pp. 220-224 Diversity of Life Investigation 6, Part 1, pp. 186-192 Planetary Science Investigation 5, Parts 2-3, pp. 158-162
Communicate scientific procedures and explanations	Weather and Water Investigation 5, Part 2, pp. 163-168 Human Brain and Senses Investigation 7, Part 1-1, pp. 210-218 Electronics Investigation 6, Part 3, pp. 195-200

Earth and Space Science

This topic focuses on Earth's hydrologic cycle, patterns that exist in atmospheric and oceanic currents, the relationship between thermal energy and the currents, and the relative position and movement of the Earth, sun, and moon.

Content Statements	FOSS
<p>The hydrologic cycle illustrates the changing states of water as it moves through the lithosphere, biosphere, hydrosphere and atmosphere.</p> <p>Thermal energy is transferred as water changes state throughout the cycle. The cycling of water in the atmosphere is an important part of weather patterns on Earth. The rate at which water flows through soil and rock is dependent upon the porosity and permeability of the soil or rock.</p>	<p>Weather and Water Investigation 6, Parts 2-3, pp. 194-205; Investigation 7, Parts 1-2, pp. 232-243 CD: Cycles, Water Cycle</p>
<p>Thermal-energy transfers in the ocean and the atmosphere contribute to the formation of currents, which influence global climate patterns.</p> <p>The sun is the major source of energy for wind, air and ocean currents and the hydrologic cycle. As thermal energy transfers occur in the atmosphere and ocean, currents form. Large bodies of water can influence weather and climate. The jet stream is an example of an atmospheric current and the Gulf Stream is an example of an oceanic current. Ocean currents are influenced by factors other than thermal energy, such as water density, mineral content (such as salinity), ocean floor topography and Earth's rotation. All of these factors delineate global climate patterns on Earth.</p>	<p>Weather and Water Investigation 5, Part 3, pp. 169-174; Investigation 7, Parts 1-2, pp. 232-243; investigation 8, Part 2, pp. 265-270; Investigation 9, Parts 1-3, pp. 296-314 Resources, pp. 32-33, 53-55 CD: Cycles, Water Cycle CD: Climate Factors</p>
<p>The atmosphere has different properties at different elevations and contains a mixture of gases that cycle through the lithosphere, biosphere, hydrosphere and atmosphere.</p> <p>The atmosphere is held to the Earth by the force of gravity. There are defined layers of the atmosphere that have specific properties, such as temperature, chemical composition and physical characteristics. Gases in the atmosphere include nitrogen, oxygen, water vapor, carbon dioxide and other trace gases. Biogeochemical cycles illustrate the movement of specific elements or molecules (such as carbon or nitrogen) through the lithosphere, biosphere, hydrosphere and atmosphere.</p>	<p>Weather and Water Investigation 2, Parts 2, pp. 76-80; Resources, pp. 6-11 CD: Elevator to Space</p>
<p>The relative patterns of motion and positions of the Earth, moon and sun cause solar and lunar eclipses, tides and phases of the moon.</p> <p>The moon's orbit and its change of position relative to the Earth and sun result in different parts of the moon being visible from Earth (phases of the moon). A solar eclipse is when Earth moves into the shadow of the moon during a new moon). A lunar eclipse is when the moon moves into the shadow of Earth (during a full moon). Gravitational force between the Earth and the moon causes daily oceanic tides. When the gravitational forces from</p>	<p>Planetary Science Investigation 4, Part 1, pp. 120-125; Investigation 9, Parts 1-4, pp. 283-301 Resources, p. 32 CD: Phases of the Moon</p>

the sun and moon align (at new and full moons) spring tides occur. When the gravitational forces of the sun and moon are perpendicular (at first and last quarter moons), neap tides occur.	
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Physical Science

This topic focuses on the empirical evidence for the arrangements of atoms on the Periodic Table of Elements, conservation of mass and energy, transformation and transfer of energy.

Content Statements	FOSS
<p>The properties of matter are determined by the arrangement of atoms. Elements can be organized into families of elements with similar properties, such as highly reactive metals, less-reactive metals, highly reactive nonmetals and some almost-completely nonreactive gases. Substances are classified according to their properties, such as metals and acids.</p> <p>When substances are combined in a mixture, the new product may have different properties, but the amount of mass does not change.</p>	<p>Chemical Interactions Investigation 2, Part 1, pp. 70-74 Resources, pp. 3-6, 91-95 Multimedia: Periodic Table</p> <p>FOSS provides the opportunity for teachers to address this content statement. See below: Chemical Interactions Investigation 8, Parts 1-2, pp. 248-262 Resources, pp. 49-51</p>
<p>Energy can be transformed from one form to another or can be transferred from one location to another, but is never lost. When energy is transferred from one system to another, the quantity of energy before transfer equals the quantity of energy after transfer. When energy is transformed from one form to another, the total amount of energy remains the same.</p>	<p>FOSS provides the opportunity for teachers to address this content statement. See below: Chemical Interactions Investigation 5, Part 1, 3, pp. 153-158, 165-171; Investigation 7, Parts 2-5, pp. 211-234 Resources, pp. 26-27, 32-48 Multimedia: Energy by Collision Multimedia: Energy Flow Weather and Water Investigation 4, Parts 1-2, pp. 121-139; Investigation 5, Parts 2-3, pp. 163-174 CD: Matter and Energy, Heat and Energy</p>
<p>Energy can be transferred through a variety of ways. Thermal energy can be transferred through radiation, convection and conduction. Mechanical energy can be transferred when objects push or pull on each other over a distance. Electromagnetic waves transfer energy when they interact with matter. Electrical energy transfers when an electrical source is connected in a complete electrical circuit to an electrical device.</p>	<p>Weather and Water Investigation 4, Parts 1-2, pp. 121-139; Investigation 5, Parts 2-3, pp. 163-174 Resources, pp. 22-26, 32-33 Video: Conduction through Metals Video: Convection Chamber Force and Motion Investigation 1, Part 1, pp. 47-56; Investigation 2, Part 3, p. 89-99; Investigation 6, Parts 1-4, pp. 218-245 Electronics Investigation 1, Parts 1-3, pp. 55-70 Resources, pp. 1-2</p>

Life Science

This topic focuses on the impact of matter and energy transfer within the biotic component of ecosystems.

Content Statements	FOSS
Matter is transferred continuously between one	

<p>organism to another and between organisms and their physical environments. Plants use the energy in light to make sugars out of carbon dioxide and water (photosynthesis). These materials can be used immediately stored for later use. Organisms that eat plants break down plant structures to produce the materials and energy they need to survive. Then they are consumed by other organisms.</p> <p>Energy can transform from one form to another in living things. Animals get energy from oxidizing their food, releasing some of its energy as heat. The total amount of matter and energy remains constant, even though its form and location change</p>	<p>Diversity of Life Resources, pp. 36-37 Populations and Ecosystems Investigation 5, Parts 2-5, pp. 151-160 Resources, pp. 14-21</p> <p>Diversity of Life Resources, pp. 36-37 Populations and Ecosystems Investigation 5, Parts 1-4 , pp. 142-169 Resources, pp. 14-21</p>
<p>In any particular biome, the number, growth and survival of organisms and populations depend on biotic and abiotic factors. Biomes are regional ecosystems characterized by distinct types of organisms that have developed under specific soil and climatic conditions.</p> <p>The variety of physical (abiotic) conditions that exists on Earth gives rise to diverse environments (biomes) and allows for the existence of a wide variety of organisms (biodiversity).</p> <p>Ecosystems are dynamic in nature; the number and types of species fluctuate over time. Disruptions, deliberate or inadvertent, to the physical (abiotic) or biological (biotic) components of an ecosystem impact the composition of an ecosystem.</p>	<p>FOSS provides the opportunity for teachers to address this content statement. See below: Populations and Ecosystems Investigation 7, pp. 210-215 Resources, pp. 30-41 CD: Ecoscenarios</p> <p>FOSS provides the opportunity for teachers to address this content statement. See below: Populations and Ecosystems Investigation 7, pp. 210-215 Resources, pp. 30-41 CD: Ecoscenarios</p> <p>FOSS provides the opportunity for teachers to address this content statement. See below: Populations and Ecosystems Investigation 4, Part 1, pp. 119-121; Investigation 7, pp. 210-215 Resources, pp. 25-41 CD: Ecoscenarios</p>

Grade Eight

Science Inquiry and Application

During the years of grades 5-8 all students must use the following scientific processes to construct their knowledge and understanding in all science content areas:

Note: FOSS is an inquiry-based program and has built into it the science processes listed below. Some examples are listed to illustrate.

Scientific Processes	FOSS
Identify questions that can be answered through scientific investigations	Populations and Ecosystems Investigation 5, Part 1, pp. 142-150 Planetary Science Investigation 5, Parts 2-3, pp. 158-167 Weather and Water Investigation 4, Part 1, pp. 121-130
Design and conduct a scientific investigation	Chemical Interactions Investigation 8, Part 1, pp. 248-255 Force and Motion Investigation 2, Part 3, pp. 89-99 Diversity of Life Investigation 9, Part 2, pp. 278-285
Use appropriate mathematics, tools and techniques to gather data and information	Force and Motion Investigation 1, Part 2, pp. 57-62 Electronics Investigation 2, Part 3, pp. 99-103 Planetary Science Investigation 8, Parts 3-4, pp. 260-270
Analyze and interpret data	Weather and Water Investigation 5, Part 1, pp. 152-162 Populations and Ecosystems Investigation 10, Part 1, pp. 302-310 Chemical Interactions Investigation 5, Part 3, pp. 165-171
Develop descriptions, models, explanations and predictions	Planetary Science Investigation 9, Parts 2-4, pp. 288-301 Human Brain and Senses Investigation 3, Parts 1-3, pp. 92-110 Earth History Investigation 4, Part 3, pp. 138-146
Think critically and logically to connect evidence and explanations	Diversity of Life Investigation 6, Parts 1-2, pp. 186-197 Chemical Interactions Investigation 9, Part 2, pp. 288-297 Force and Motion Investigation 7, Part 2, pp. 262-266
Recognize and analyze alternative explanations and predications	Earth History Investigation 6, Part 4, pp. 220-224 Diversity of Life Investigation 6, Part 1, pp. 186-192 Planetary Science Investigation 5, Parts 2-3, pp. 158-162
Communicate scientific procedures and explanations	Weather and Water Investigation 5, Part 2, pp. 163-168 Human Brain and Senses Investigation 7, Part 1-1, pp. 210-218 Electronics Investigation 6, Part 3, pp. 195-200

Earth and Space Science

This topic focuses on the physical features of Earth and how they formed. This includes the interior of Earth, the rock record, plate tectonics and landforms.

Content Statements	FOSS
<p>The composition and properties of Earth's interior are identified by the behavior of seismic waves. The refraction and reflection of seismic waves as they move through one type of material to another is used to differentiate the layers of Earth's interior. Earth has an inner and outer core, an upper and lower mantle, and a crust.</p> <p>The formation of the planet generated heat from gravitational energy and the decay of radioactive elements, which is still present today. Heat released from Earth's core drives convection currents throughout the mantle and the crust.</p>	<p>Earth History Resources, pp. 100-102</p> <p>Earth History Resources, pp. 101-102</p>
<p>Earth's crust consists of major and minor tectonic plates that move relative to each other. Historical data and observations such as fossil distribution, paleomagnetism, continental drift and sea-floor spreading contributed to the theory of plate tectonics. The rigid tectonic plates move with the molten rock and magma beneath them in the upper mantle.</p> <p>Convection currents in the crust and upper mantle cause the movement of the plates. The energy that forms convection currents comes from deep within the Earth.</p> <p>There are three main types of plate boundaries: divergent, convergent and transform. Each type of boundary results in specific motion and causes events (such as earthquakes or volcanic activity) or features (such as mountains or trenches) that are indicative of that type of boundary.</p>	<p>Earth History Resources, pp. 100-102</p> <p>Earth History Resources, pp. 101-102</p> <p>Earth History Resources, pp. 101-102</p>
<p>A combination of constructive and destructive geologic processes formed Earth's surface. Earth's surface is formed from a variety of different geologic processes, including but not limited to plate tectonics.</p>	<p>Earth History Investigation 3, Part 4, pp. 108-111; Investigation 4, Parts 3-4 Resources, pp. 100-105 CD: Geology Lab, Earth Processes</p>
<p>Evidence of the dynamic changes of Earth's surface through time is found in the geologic record. Earth is approximately 4.6 billion years old. Earth history is based on observations of the geologic record and the understanding that processes observed at present day are similar to those that occurred in the past (uniformitarianism). There are different methods to determine relative and absolute age of some rock layers in the geologic record. Within a sequence of undisturbed sedimentary rocks, the oldest rocks are at the bottom (superposition). The geologic record can</p>	<p>Earth History Investigation 3, Parts 2-4, pp. 96-111; Investigation 5, Part 4, pp. 188-193; Investigation 6, Parts 3-4, pp. 215-224; Investigation 7, Parts 1-2, pp. 234-243 Resources, pp. 73-88, 103-105 CD: Geology Lab, Earth Processes CD: Time Room</p>

help identify past environments and climate conditions.	
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Physical Science

This topic focuses on forces and motion within, on and around the Earth and within the universe.

Content Statements	FOSS
<p>Some forces between objects act when the objects are in direct contact or when they are not touching. Magnetic, electrical and gravitational forces can act at a distance.</p>	<p>Force and Motion Investigation 7, Parts 1-3, pp. 256-272 Resources, pp. 50-52, 62-69 Planetary Science Resources, pp. 70, 84-86 Electronics CD: Static Electricity</p>
<p>Forces have magnitude and direction. The motion of an object is always measured with respect to a reference point.</p> <p>Forces can be added. The net force on an object is the sum of all of the forces acting on the object. The net force acting on an object can change the object's direction and/or speed.</p> <p>When the net force is greater than zero, the object's speed and/or direction will change. When the net force is zero, the object remains at rest or continues to move at a constant speed in a straight line.</p>	<p>Force and Motion Investigation 1, Part 1, pp. 47-56; Investigation 2, Part 3, pp. 89-99; Investigation 4, Parts 1-3, pp. 138-155 Resources, pp. 17-19, 27-31</p> <p>Force and Motion Investigation 6, Parts 1-4, pp. 218-245; Investigation 8, Part 1, pp. 284-293 Resources, pp. 53-61, 70-74 Multimedia; Force Bench</p> <p>Force and Motion Investigation 1, Part 1, pp. 47-56; Investigation 2, Part 3, pp. 89-99; Investigation 6, Parts 1-4, pp. 218-245; Investigation 8, Part 1, pp. 284-293</p>
<p>There are different types of potential energy. Gravitational potential energy changes in a system as the masses or relative position(s) of objects are changed. Objects can have elastic potential energy due to their compression, or chemical potential energy due to the nature and arrangement of the atoms that make up the object.</p>	<p>Force and Motion Investigation 1, Part 1, pp. 47-56; Investigation 2, Part 3, pp. 89-99; Investigation 7, Part 2, pp. 262-266 Resources, pp. 153-61, 70-74</p>

Life Science

This topic focuses on continuation of the species.

Content Statements	FOSS
<p>Diversity of species occurs through gradual processes over many generations. Fossil records provide evidence that changes have occurred in number and types of species. Fossils provide important evidence of how life and environmental conditions have changed.</p> <p>Changes in environmental conditions can affect how beneficial a trait will be for the survival and reproductive success of an organism or an entire species.</p> <p>Throughout Earth's history, extinction of a species has occurred when the environment changes and</p>	<p>Earth History Investigation 7, Part 1, pp. 234-242 Resources, pp. 83-87</p> <p>Populations and Ecosystems Investigation 10, Parts 1, 3, pp. 302-310, 315-317 Resources, pp. 59-61</p> <p>Earth History Investigation 6, Part 3, pp. 215-219; Investigation 7, Parts 1-2, pp. 234-243</p>

<p>the individual organisms of that species do not have the traits necessary to survive and reproduce in the changed environment. Most species (approximately 99 percent) that have lived on Earth are now extinct.</p>	<p>Resources, pp. 83-87 Populations and Ecosystems Investigation 10, Part 3, pp. 315-317 Resources, pp. 59-61</p>
<p>Reproduction is necessary for the continuation of every species. Every organism alive today comes from a long line of ancestors who reproduced successfully every generation. Reproduction is the transfer of genetic information from one generation to the next. It can occur with mixing of genes from two individuals (sexual reproduction). It can occur with the transfer of genes from one individual to the next generation (asexual reproduction). The ability to reproduce defines living things.</p>	<p>Populations and Ecosystems Resources, pp. 46-52</p>
<p>The characteristics of an organism are a result of inherited traits received from parent(s). Expression of all traits is determined by genes and environmental factors to varying degrees. Many genes influence more than one trait, and many traits are influenced by more than one gene.</p> <p>During reproduction, genetic information (DNA) is transmitted between parent and offspring. In asexual reproduction, the lone parent contributes DNA to the offspring. In sexual reproduction, both parents contribute DNA to the offspring.</p>	<p>Populations and Ecosystems Investigation 9, Parts 1-4, pp. 267-291 Resources, pp. 46-52</p> <p>Populations and Ecosystems Investigation 9, Part 3, pp. 274-286 Resources, pp. 46-52 Diversity of Life Investigation 7, Part 1, pp. 218-223 Resources, pp. 43-44</p>